

U.S. Patent Application Serial No. 10/628,188
Fechko et al.
Amendment and Response (Office Action of 10/18/2005)
February 20, 2006
Page 10 of 14

Remarks and Arguments

The Applicants amend claims 1, 11, and 21.

The Applicants cancel claims 5, 14, 26, and 32.

The Applicants withdraw claims 9, 10, 20, 30, and 31.

The remaining claims are unchanged from the original.

The remarks herein refer to the claims as amended. The Applicants respond to each paragraph of the October 18, 2005, Office Action as follows:

Office Action Paragraphs 1-4

The Applicants affirm the provisional election of Group I (claims 1-8, 11-19, 21-29, and 32) as restricted by the Examiner. The Applicants reserve the right to file any divisional cases directed to the subject matter of the withdrawn claims.

Office Action Paragraphs 5-6

The Examiner rejects Claims 1-7, 11-17, 21-29 and 32 under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2001/0019132 (the "Carter '132 application") in view of Japanese Publication No. 08-208380 (the Otani '380 application). The Examiner acknowledges that the Carter application fails to disclose the step of introducing a hydrogen ambient into the growth chamber, and, therefore, combines the Otani application to show that element. The Examiner, however, does not give any specifics as to the process conditions that would be necessary to combine the disparate disclosures of the two published applications and achieve the claimed method.

In response, the Applicants amend independent claims 1, 11, and 21 to recite temperature conditions by which the Applicants realize the claimed method of controlling nitrogen content. Each amended independent claim recites maintaining the silicon carbide source powder at a temperature of between about 2000°C and 2500°C and maintaining the seed crystal at a temperature of between about 50°C and 350°C lower than the temperature of the source powder. This recitation was originally included in

U.S. Patent Application Serial No. 10/628,188
Fechko et al.
Amendment and Response (Office Action of 10/18/2005)
February 20, 2006
Page 11 of 14

respective dependent claims 5, 14, and 26, now canceled. The Examiner considers the temperature recitations to be shown in the Carter '132 application (Paragraphs 37, 38). The Examiner, therefore, would simply substitute desired hydrogen of the Otani disclosure into the Carter application and deem the result obvious.

Given the claim amendments included herein, however, the Otani '380 application is particularly ineffective for combining with the Carter '132 application to defeat patentability. The Otani '380 application neither shows nor suggests any temperature gradient in the growth chamber. Otani states (Translated Paragraph 11, Lines 12-15) that "the work piece coil 8 is installed in the periphery of the duplex quartz tube 5, by passing the high frequency current, the crucible 3 made from a graphite can be heated and a raw material and seed crystal can be heated to desired temperature." The use of the singular "temperature" negates any suggestion that Otani would use either the Applicant's claimed temperature gradient or the temperature gradient required by the Carter '132 application. Furthermore, Otani (Drawing 1) shows a single work piece coil 8 as the heating element. The same coil surrounds the source and seed during sublimation. There is no suggestion in the Otani drawing that the work piece coil could provide anything but a single, constant temperature throughout the growth chamber.

Without the ability to create a temperature gradient, the Otani disclosure is irrelevant to the amended claim. Most significantly, Otani's single temperature operation precludes any motivation for one to combine the Otani '380 application with the Carter '132 application. There would have been no suggestion at the time of Applicants' invention that the hydrogen shown in Otani's single temperature chamber would have a positive effect when combined with Carter's method that requires a temperature gradient.

The combination of the Carter '132 application and the Otani '380 application cannot be combined to show the obviousness of the amended independent claims herein.

Claims 2, 3, 12, 13, 24, and 25 recite process conditions for pressure and flow rate. The Examiner considers these claims obvious upon the combination of the Carter and Otani documents. As the Applicant points out in regard to the independent claims, the Otani application is void of any disclosure regarding the temperature gradient

U.S. Patent Application Serial No. 10/628,188
Fechko et al.
Amendment and Response (Office Action of 10/18/2005)
February 20, 2006
Page 12 of 14

required by the Carter '132 application. Without the temperature gradient, there is no suggestion in Otani that the pressure conditions shown in Otani would work in conjunction with the Carter method.

Similarly, the flow rates claimed in the Applicant's dependent claims 3, 13, and 25 cannot be considered inherent, as suggested by the Examiner, in the combination of the Carter and Otani applications. As discussed above, one would have no motivation to use such a combination, so the claimed features should not be considered inherent in the combined references. In fact, with such diverse temperature conditions, one cannot tell what features would result in a crystal formed by combining the Carter and Otani disclosures.

Office Action Paragraph 7

The Examiner rejects Claims 8 and 18 under 35 U.S.C. § 103(a) as being unpatentable over the Carter '132 application in view of the Otani '380 application and further in view of Japanese Patent Application No. 06-128094 (the "Maeda '094 application"). Claims 8 and 18 recite the addition of a hydrocarbon to the growth chamber, and the Examiner admits that Carter and Otani are silent in this regard. The Applicants respectfully submit that the Maeda '094 application is inadequate to combine with the Carter and Otani publications to achieve the invention of Claims 8 and 18. This is particularly so in light of the claim amendments reciting the temperature conditions of the Applicants' method.

Maeda is quite clear at Paragraph 4 of the translation provided by the Examiner that the seed crystal is held at a temperature of about 200° C for sublimation growth. This low temperature is outside the realm of the amended claims and the Carter and Otani disclosures. As discussed above, Carter (Paragraphs 37, 38) shows a temperature at the seed crystal of about 300 to 350 ° C lower than the source at 2360 to 2380 ° C. Otani (Paragraph 12) keeps a constant temperature throughout the growth chamber of about 2400 ° C. In this regard, Maeda's disclosure showing the seed crystal at 200° C is a drastic difference from the other references. One would have absolutely no idea how the

U.S. Patent Application Serial No. 10/628,188
Fechko et al.
Amendment and Response (Office Action of 10/18/2005)
February 20, 2006
Page 13 of 14

hydrocarbon shown in Maeda would work with the temperatures shown in the Carter and Otani applications. Accordingly, the Applicants respectfully submit that Claims 8 and 18 are patentable over the combination of Carter, Otani, and Maeda because there would have been no suggestion at the time of invention that such a combination would actually work.

Office Action Paragraph 8

The Examiner adds a second rejection of Claims 8, 11-18, 21-29 and 32 as being unpatentable over the Carter-Otani-Maeda combination in further view of U.S. Patent No. 5,611,955 (the "Barrett '955 patent"). The Examiner admits that the Carter-Otani-Maeda combination fails to show or suggest maintaining a sufficient hydrogen concentration in the ambient of the growth chamber to passivate the growing silicon carbide crystal. The Examiner considers such passivation inherent and uses the Barrett '955 patent to support such inherency.

First, as discussed above neither the Carter-Otani combination nor the Carter-Otani-Maeda combination gives any indication that the method resulting from the combination would be successful. Without some likelihood of success in the combination, the Applicants respectfully argues that the Examiner should not be able to deny patentability upon an inherency argument.

The Applicants further respectfully submit that the Barrett disclosure has the same inadequacy in its disclosure of temperature conditions that Carter, Otani and Maeda suffer. The only disclosure regarding temperature conditions in the Barrett '955 patent shows that the source powder was held in the range of 2300° C to 2350° C. Barrett's seed crystal was maintained at 110° C to 130° C lower than the source. In comparison, Carter (Paragraphs 37, 38) shows a temperature at the seed crystal of about 300 to 350 ° C lower than the source. Otani (Paragraph 12) keeps a constant temperature throughout the growth chamber of about 2400 ° C. Maeda's disclosure shows the seed crystal at 200° C, which is significantly outside the scope of the Carter, Otani, and Barrett disclosures. The Applicant, therefore, respectfully states that Barrett's disclosure adds

U.S. Patent Application Serial No. 10/628,188
Fechko et al.
Amendment and Response (Office Action of 10/18/2005)
February 20, 2006
Page 14 of 14

yet another range of temperatures and other diverse process conditions to an already diverse group of references. The Applicants argue that Barrett should not be used in this case to show any common inherency among the Examiner's references. The four references are distinct, offer no suggestion or motivation for combination, and should not be combined under 35 U.S.C. § 103(a) to defeat patentability of the amended claims.

Conclusion

The Applicants respectfully request that the Examiner reconsider all of the rejections noted in this Amendment and Response and issue a Notice of Allowance accordingly.

The Applicants are paying a fee for a one month extension of time for filing this Response and Amendment. If additional fees are required or if any credits are due, the Examiner is hereby authorized to charge or credit Deposit Account No. 50-0332 as appropriate.

Respectfully submitted,



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